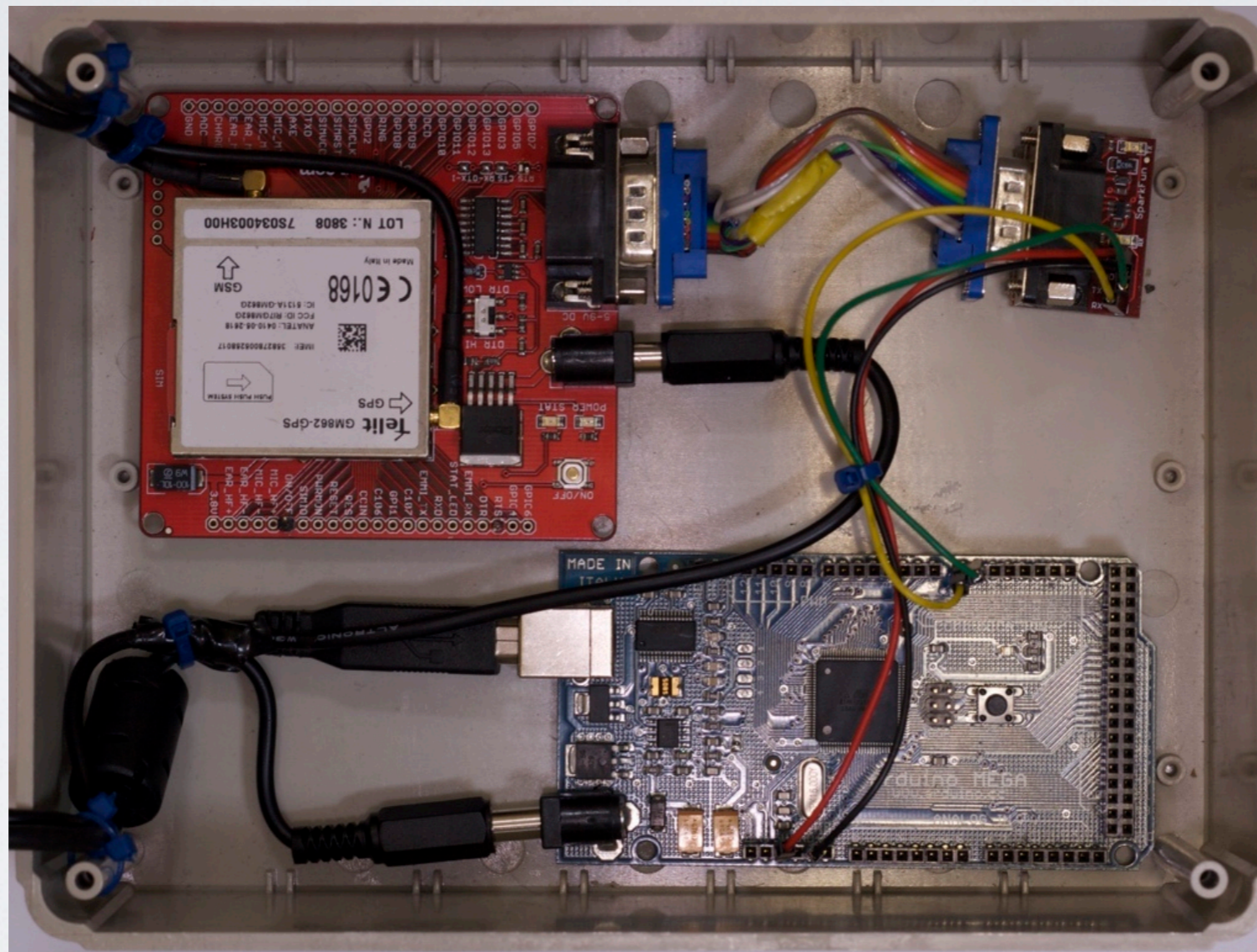


# CELLULAR GPS TRACKER

## WITH ARDUINO



Trent Lloyd <[lathiat@burst](mailto:lathiat@burst)>



WHY?



Maxitronix

# Electronic Lab

The Fun Way to Learn About Electronics And Study the Wonders of Science.

**130**  
in ONE



TRANSFORM

SPEAKER

INTEGRATED  
CIRCUIT

QUAD 2-INPUT NAND

DUAL OP AMP

DIGITAL DISPLAY

LED-1  
LED-2  
LED-3

TRANSISTORS

PNP  
NPN

BATTERIES

1.5V  
1.5V  
1.5V

DIODES

SWITCH

KEY

RADIO CIRCUITS

TERMINALS

RESISTORS

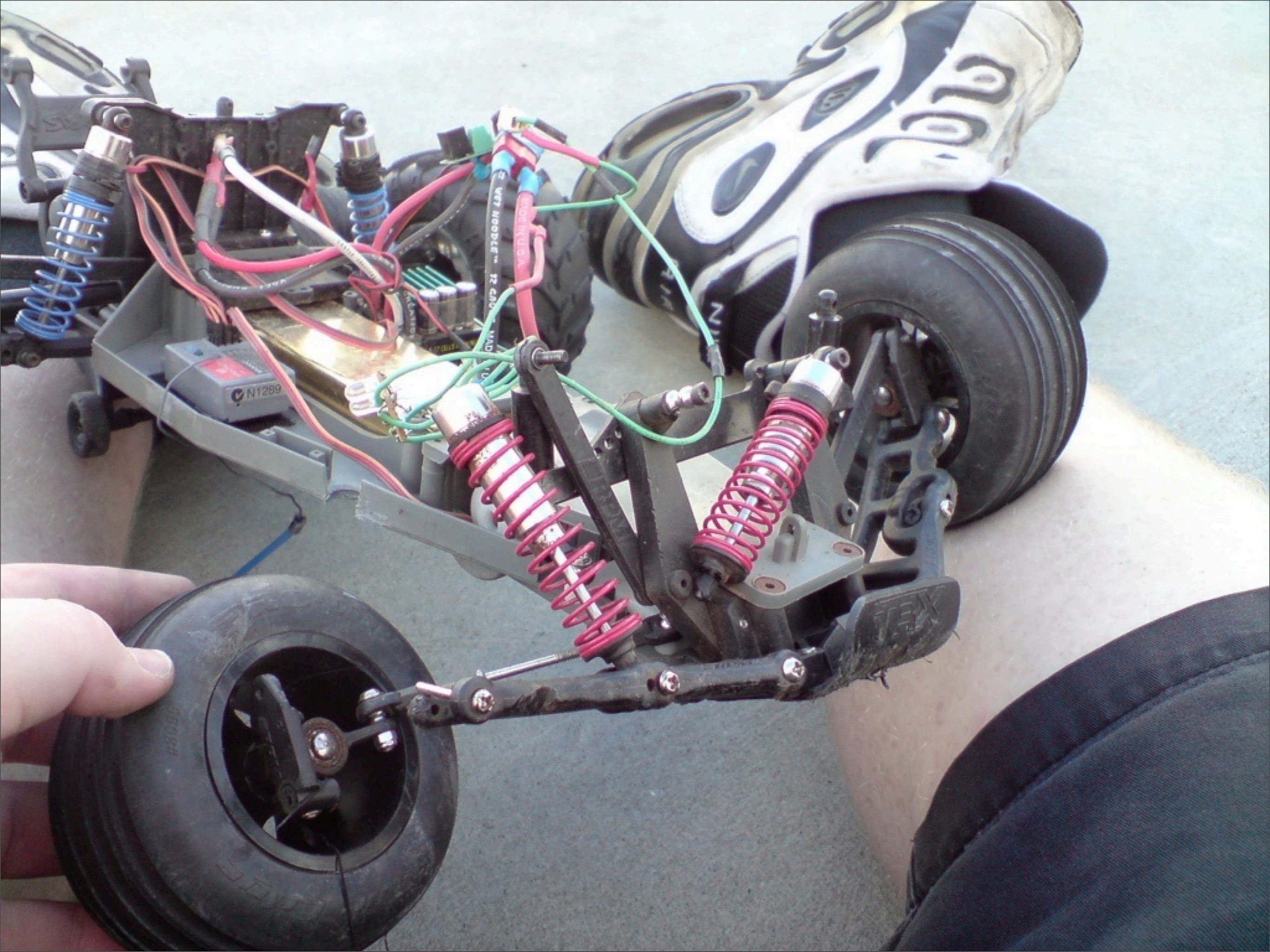
CAPACITORS







**GODWIN**  
PROPERTY GROUP PTY LTD  
**FOR SALE**  
SOLD  
Shane Godwin  
0419 926 521  
Telephone - 9272 2230  
www.godwinproperty.com













Saturday, 10 April 2010



Saturday, 10 April 2010



Saturday, 10 April 2010



Saturday, 10 April 2010







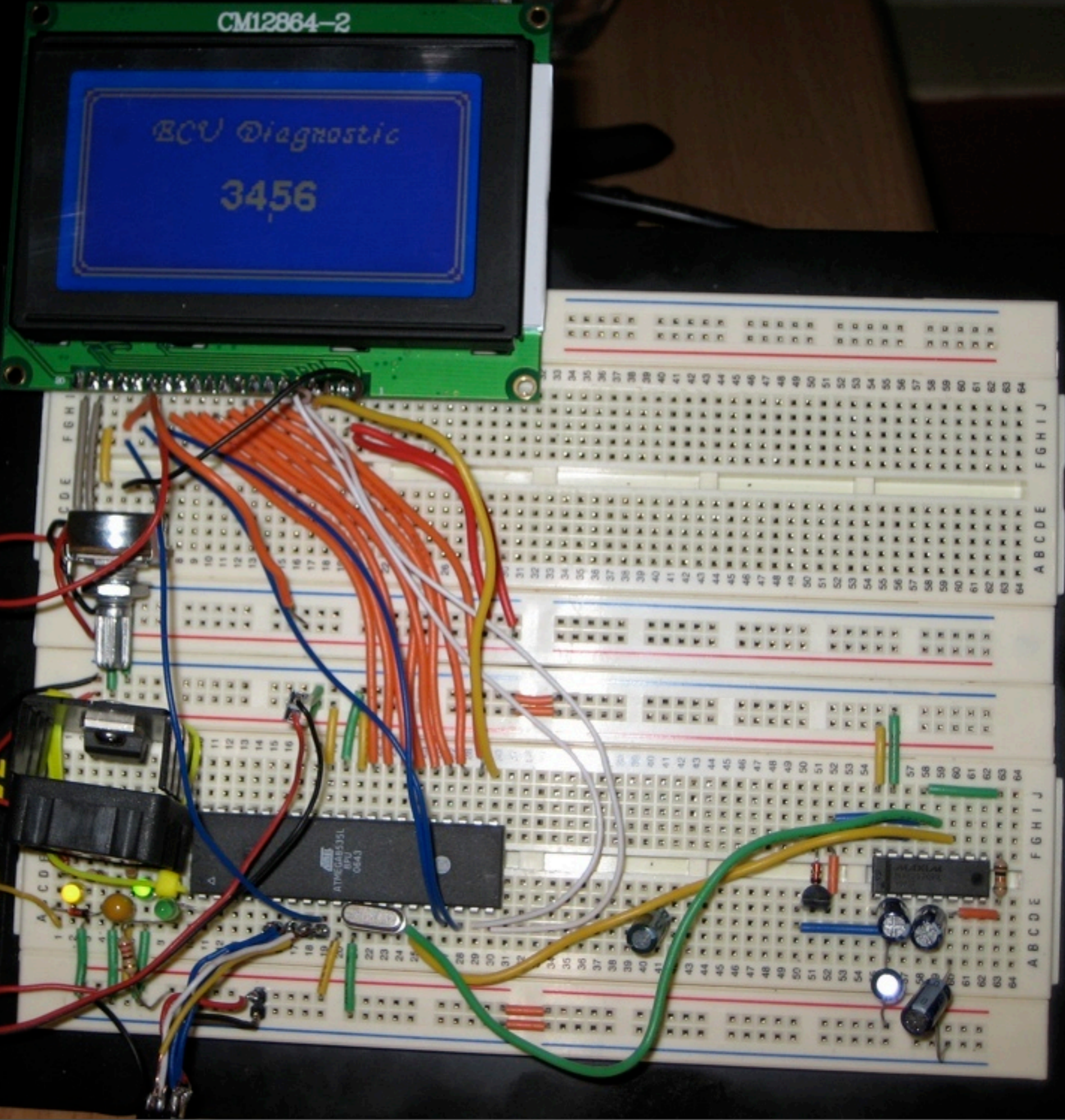


CM12864-2

BCU Diagnostic

3456

INTEGRATED  
BREAD-BOARD  
FAYSTAR

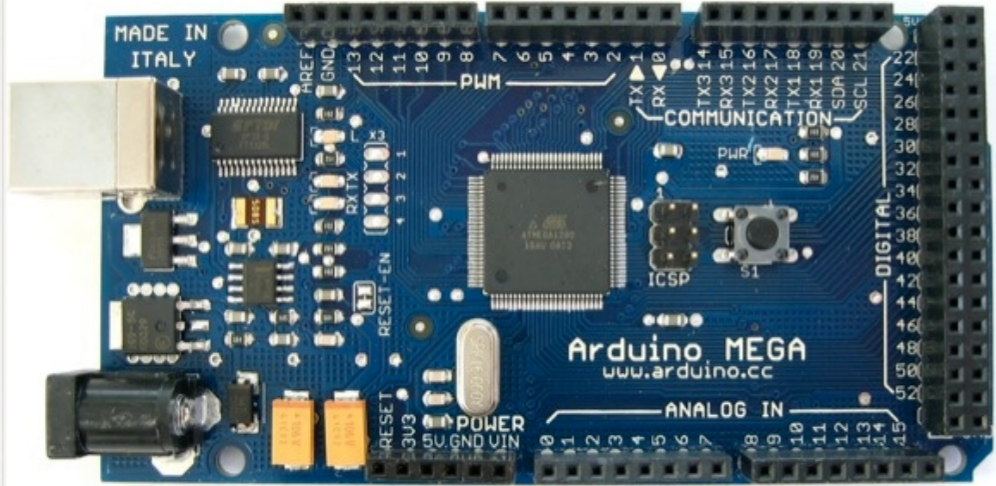


DC I  
Input  
Output



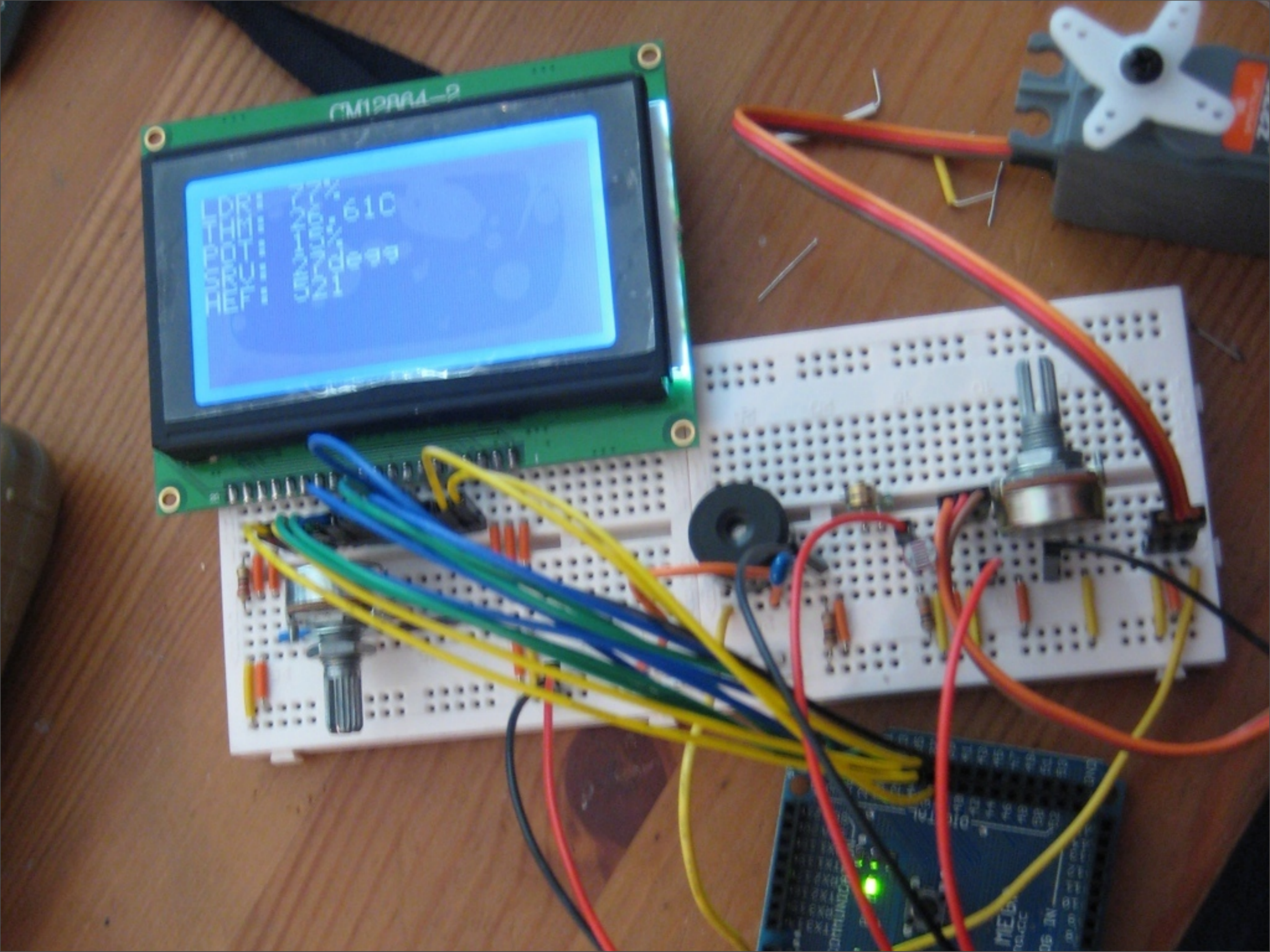


+



+





CM12864-2  
MADE IN SINGAPORE ORIGINAL ONLY

Hello, World!

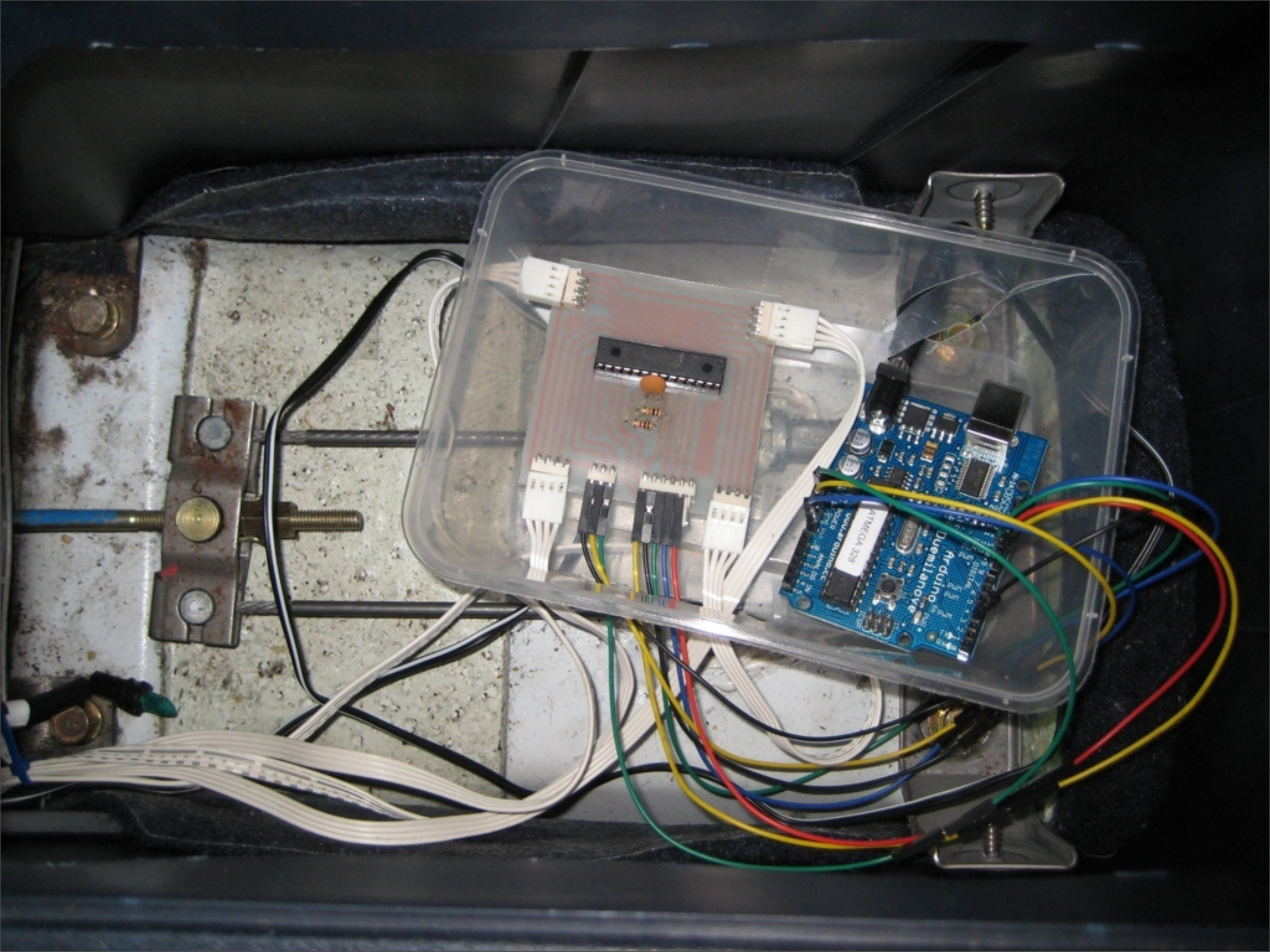


RPM: 812

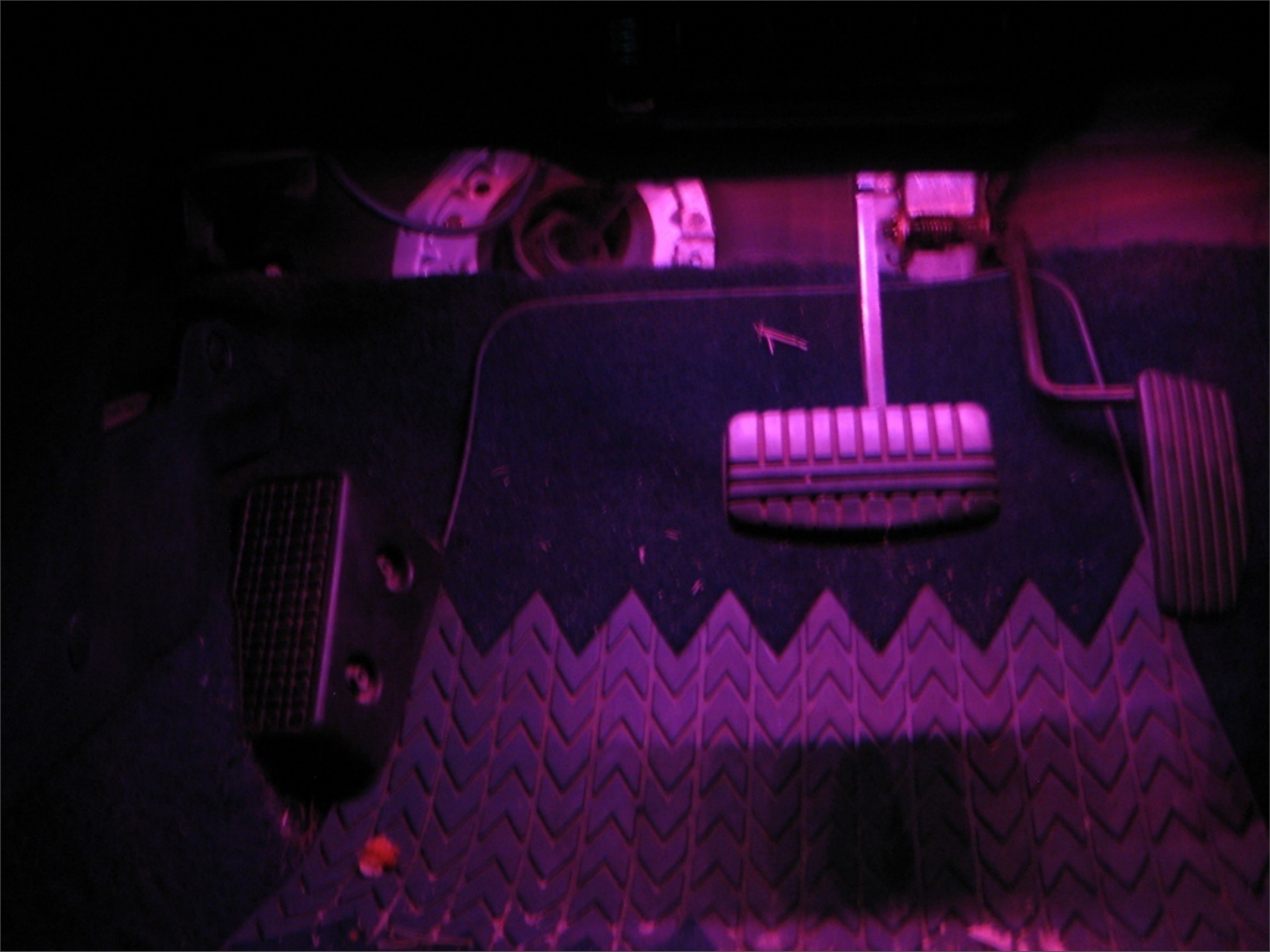
U:	14	T:	0	R:	2
S:	2	Q:	0	P:	0

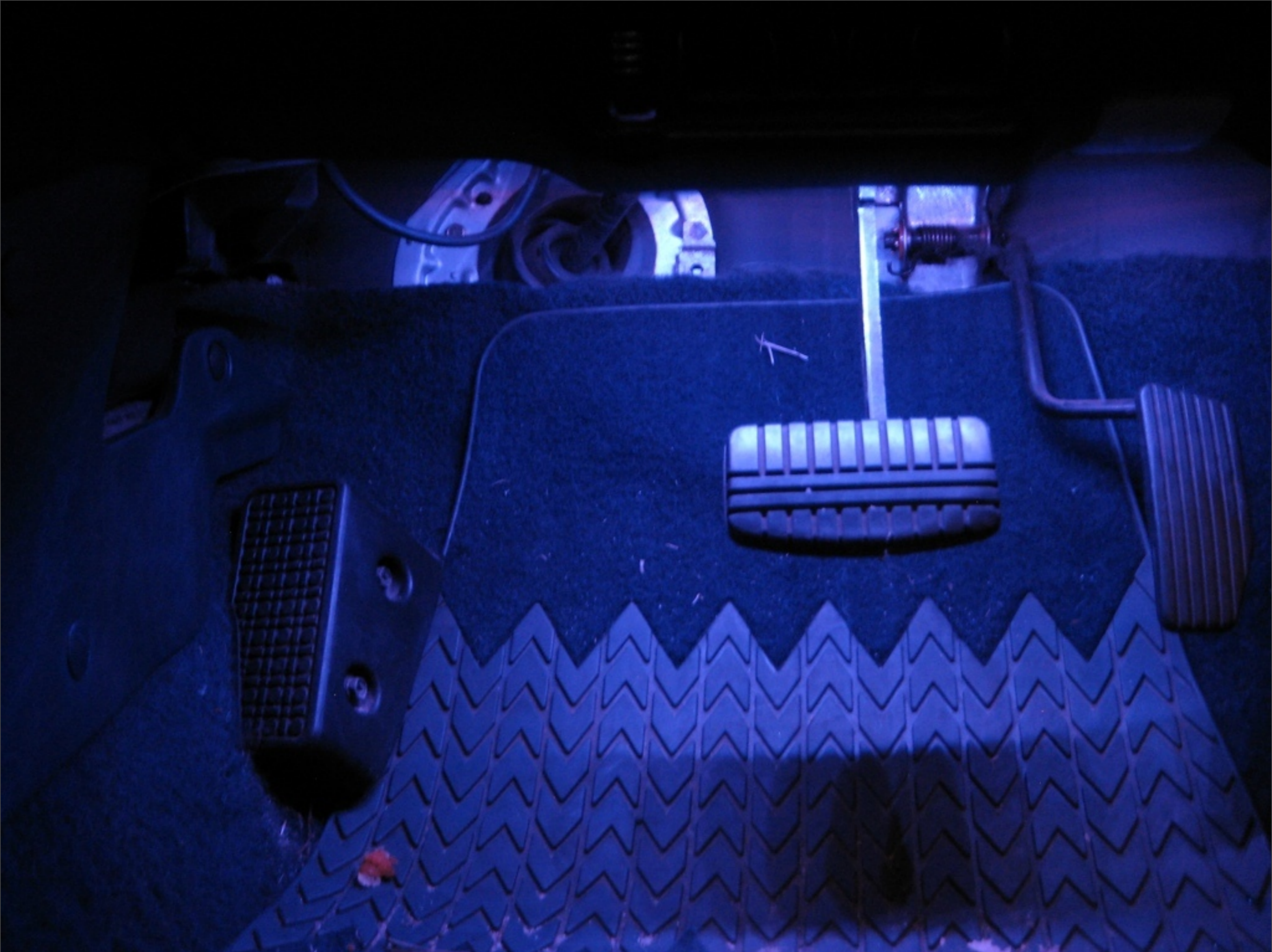
183

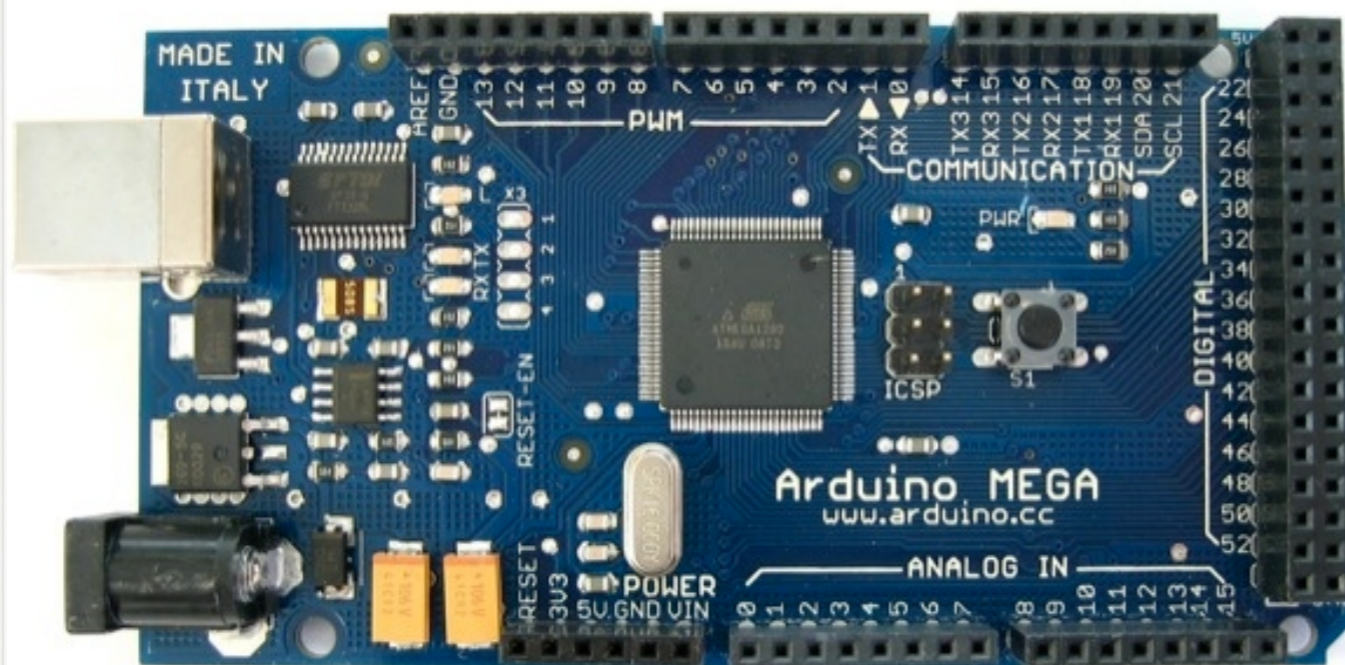
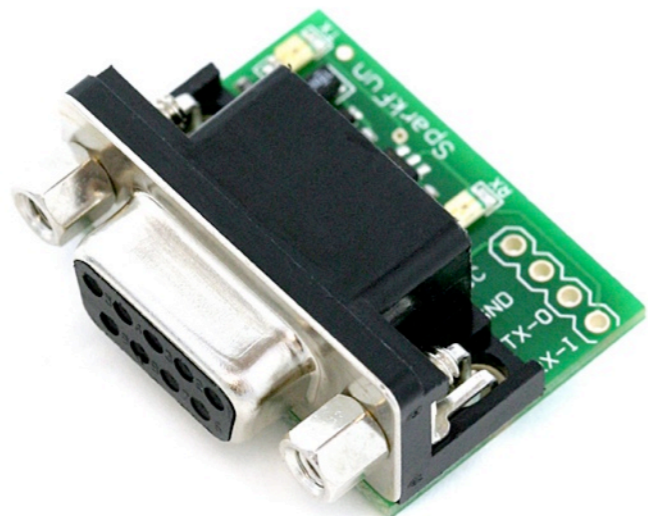
AER	54%	COO	29C	
RPM	138	FTH	104.5%	
FTL	107.6%	FTM	99.8%	
INJ	4.09ms	OXT	99.8%	
OXY	0V	TPS	13%	
AHZ	50Hz	AIR	90	E
AUM	0	BAR	0.9B	
ISC	52	KCK	0	





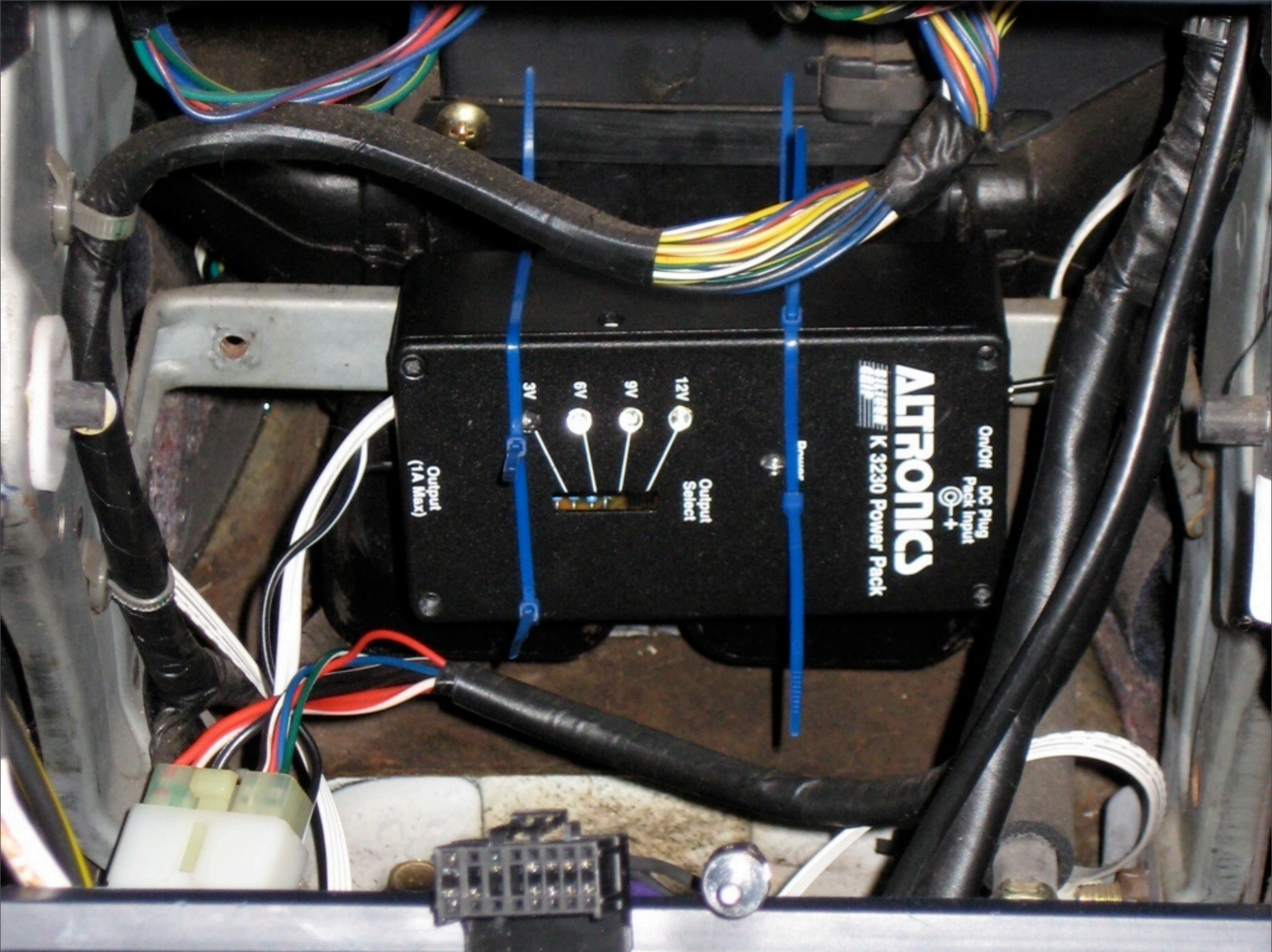










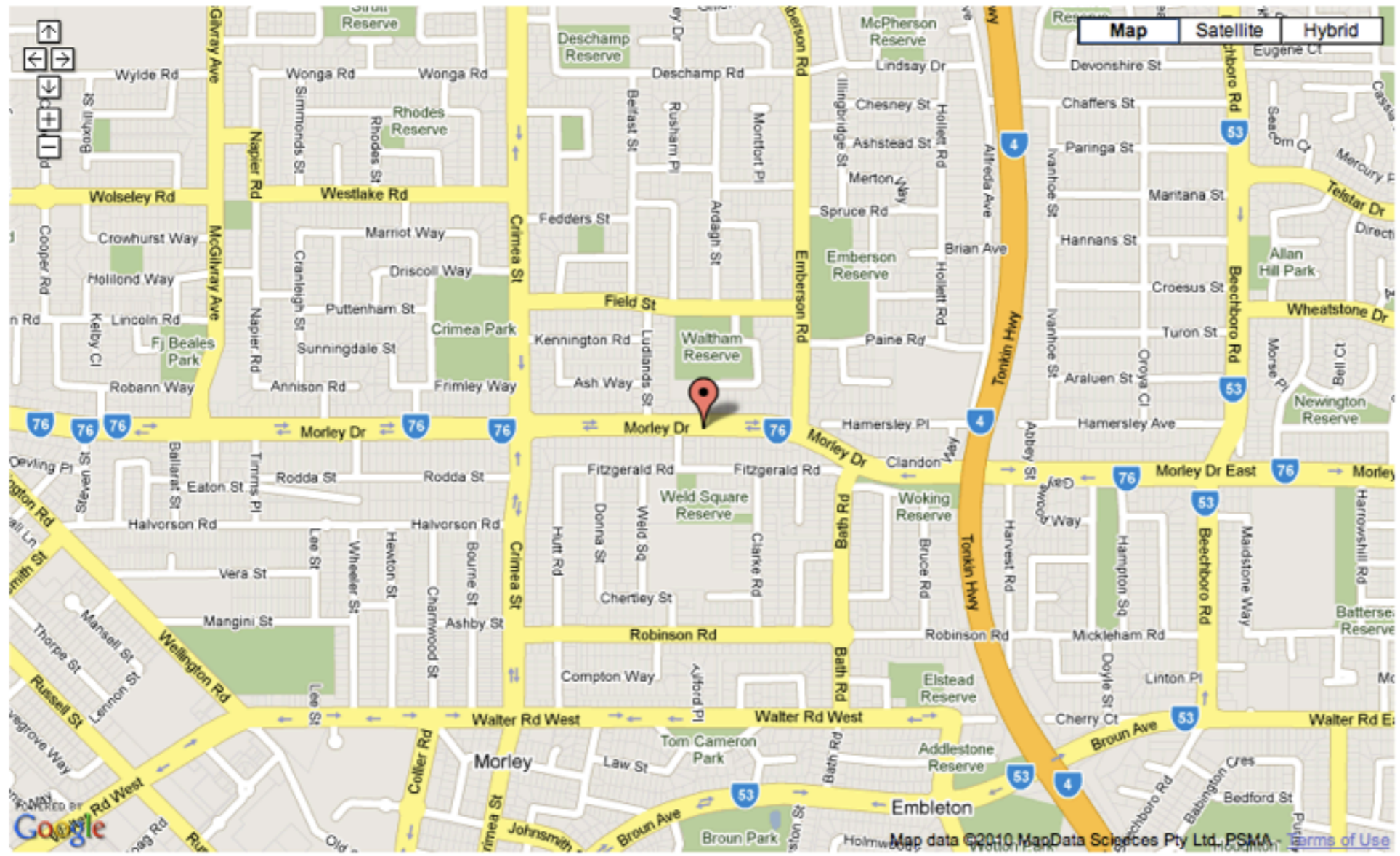


# Trent "Lathiat" Lloyd

twitter: 3 people, sitting in my loungeroom with macs out, watching the apple keynote video on my TV #ohyeah .. while writing barcamp talk (updated 4 hours ago)

[about](#) [blog](#) [twitter](#) [reader](#) [tracker](#) [talks](#) [contact](#) [email](#) [facebook](#) [twitter](#) [msn](#) [skype](#) [jabber](#)

Position: -31.887875 115.910123333  
Last Updated: Fri, 09 Apr 2010 22:09:29



## lathiat's blog

Watch out for hostname changes...  
Checking ldirectord is alive...  
At Linux.conf.au 2009 and star...  
Avahi is now 3 years old.....  
Macbook broken. again...  
Traveling to sydney.....

## read what lathiat reads

Bank Employee Plants Malware o...  
Dwarf Planets Accumulate In Ou...  
PS3 Owner Refunded For Missing...  
Apple's WebKit2 Coming Soon, W...  
WebKit2 posted...  
MONyog MySQL Monitor 3.74 Has ...

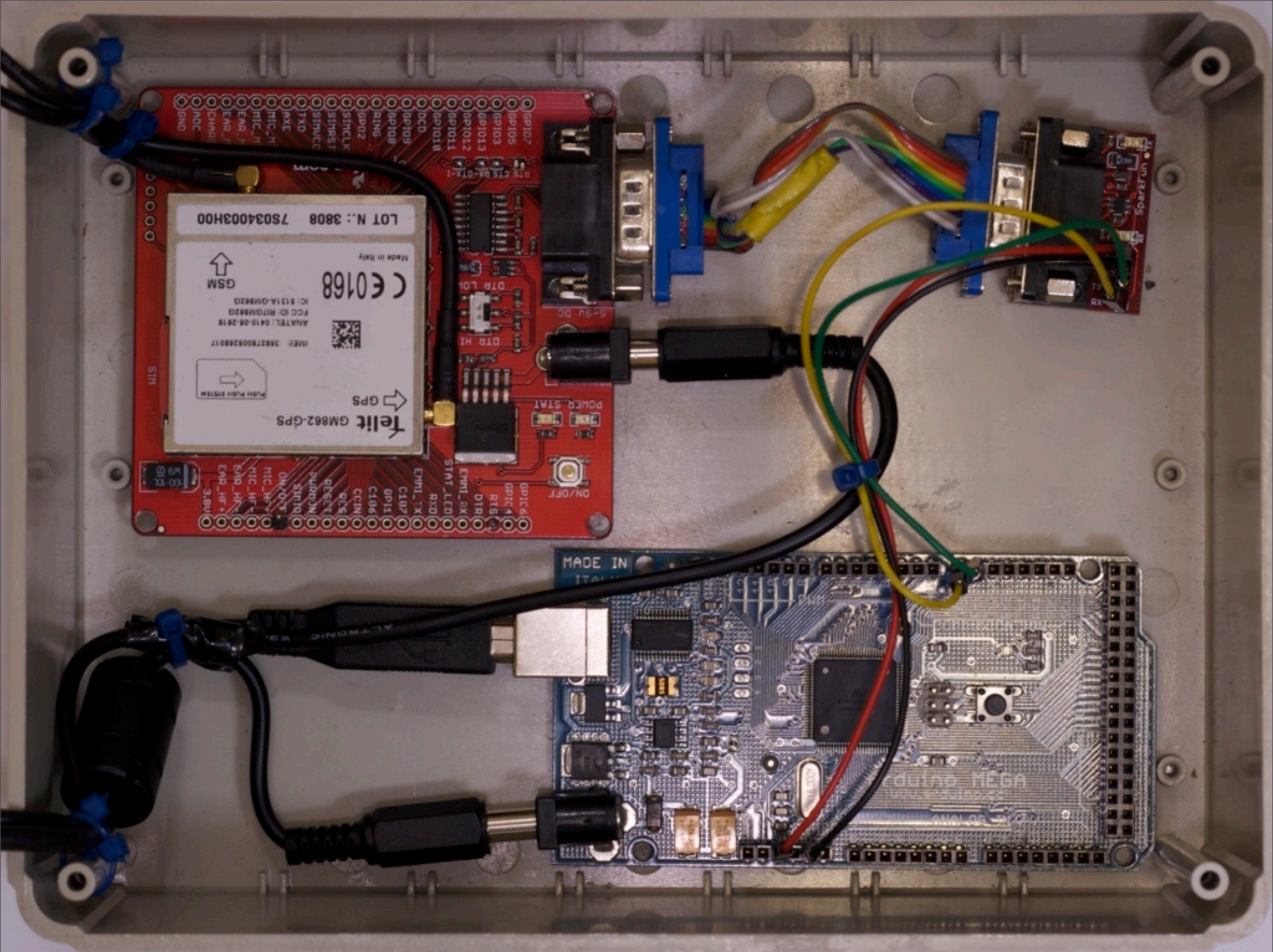
## lathiat's tweets

lathiat: 3 people, sitting in my loungeroom with macs out, watching the apple keynote video on my TV #ohyeah .. while writing barcamp talks... 4 hours ago

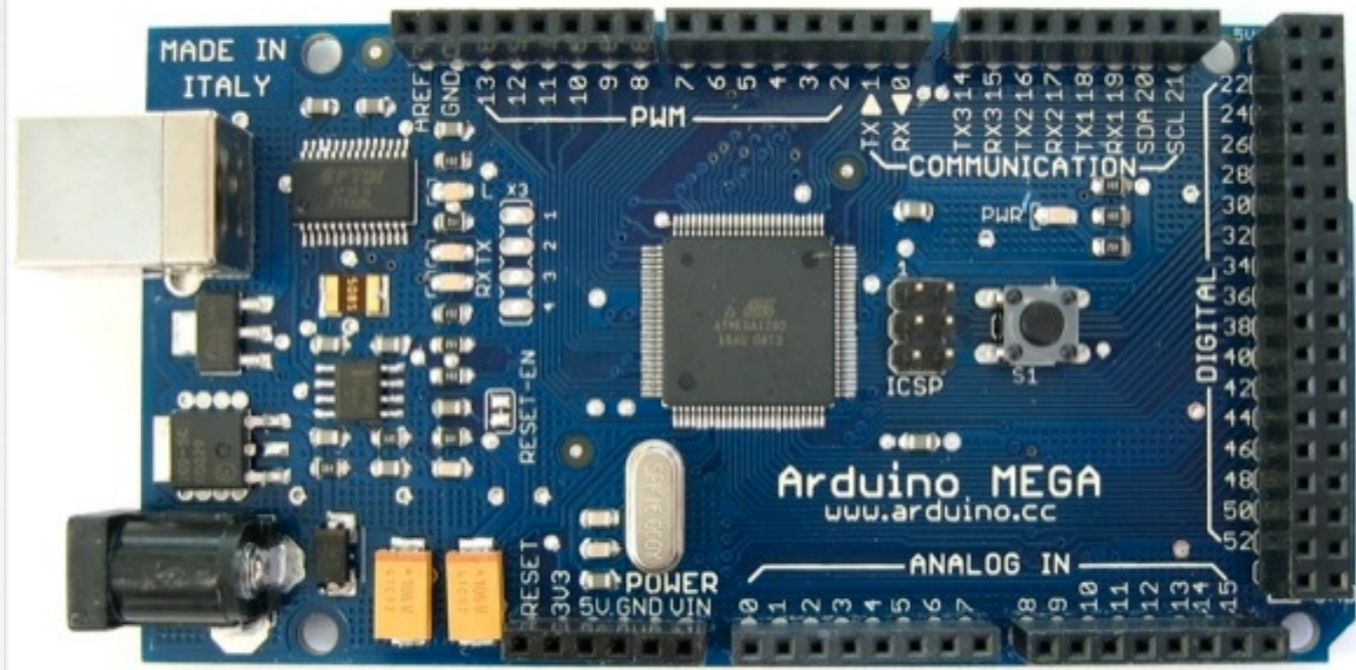
lathiat: @mattman do it!... 4 hours ago

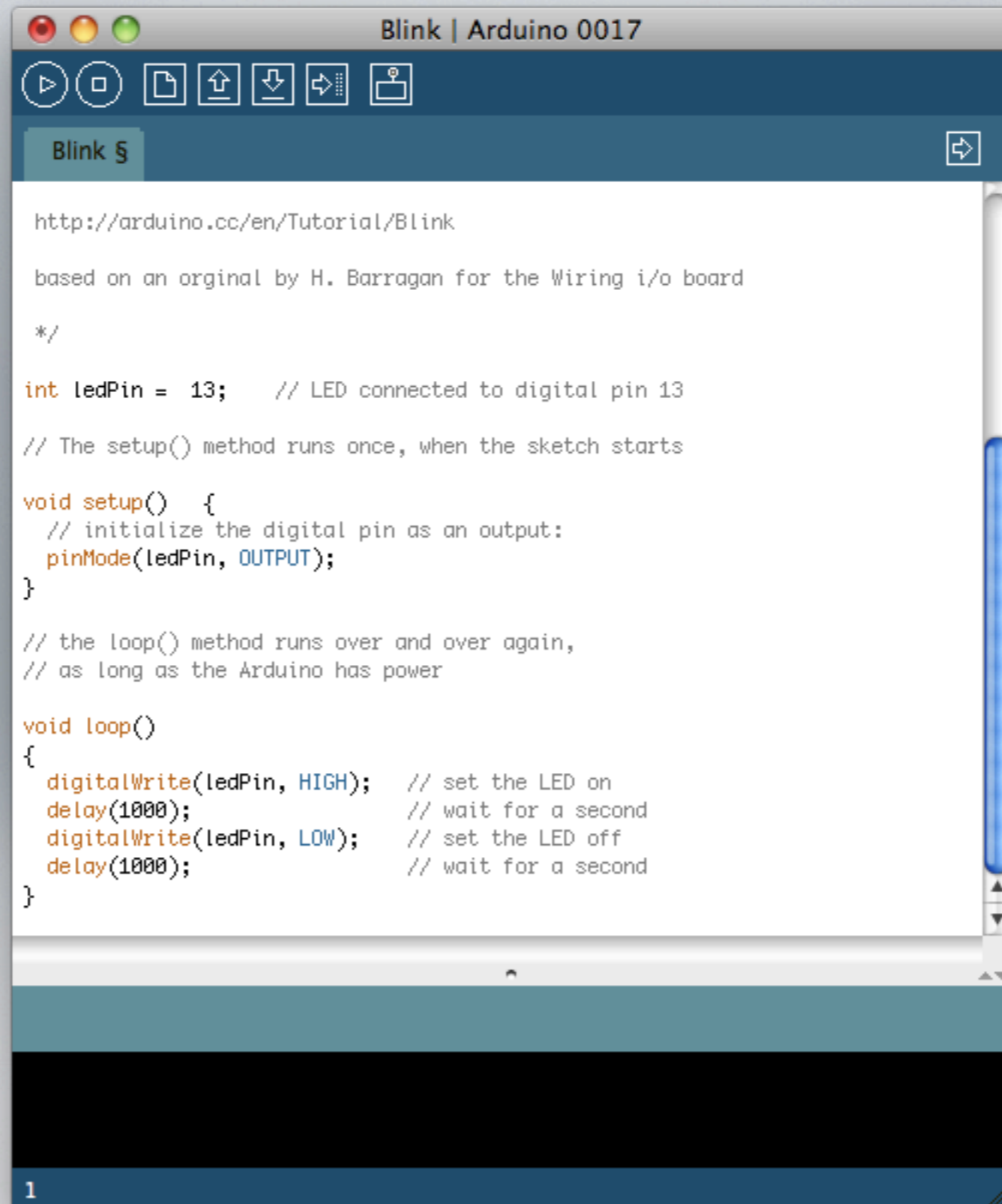
lathiat: So GPS tracker is working.. http://lathiat.net/tracker .. now I just

# HARDWARE



# SOFTWARE





The image shows a screenshot of the Arduino IDE interface. The window title is "Blink | Arduino 0017". The top toolbar contains icons for running, stopping, saving, uploading, downloading, and help. Below the toolbar, a tab labeled "Blink §" is active. The main text area contains the following code:

```
http://arduino.cc/en/Tutorial/Blink

based on an original by H. Barragan for the Wiring i/o board

*/

int ledPin = 13;    // LED connected to digital pin 13

// The setup() method runs once, when the sketch starts

void setup() {
  // initialize the digital pin as an output:
  pinMode(ledPin, OUTPUT);
}

// the loop() method runs over and over again,
// as long as the Arduino has power

void loop()
{
  digitalWrite(ledPin, HIGH);  // set the LED on
  delay(1000);                 // wait for a second
  digitalWrite(ledPin, LOW);  // set the LED off
  delay(1000);                 // wait for a second
}
```

The bottom status bar shows the number "1".

AT+CGDCONT=1,"IP","VirginInternet"

OK

AT#SGACT

#SGACT: 1|4.75.200.12|

OK

AT\$GPSACP

\$GPSACP: 0000|7.03|,,,,,0,,,,29|006,00

OK

AT#SD=2,0,80,"www.lathiat.net"

CONNECT





INCLUDES

FREE  
NEWNES ONLINE  
MEMBERSHIP



# PRACTICAL UML STATECHARTS

IN **C/C++**, Second Edition

Event-Driven Programming for  
Embedded Systems

- Focuses on core concepts
- Provides a complete, ready-to-use, open source software architecture
- Includes an extensive example using the ARM Cortex-M3

Miro Samek

- QState GPS\_initial(GPSHSM \*me);
- QState GPS\_operational(GPSHSM \*me);
- QState GPS\_powerup(GPSHSM \*me);
- QState GPS\_powerup\_echooff(GPSHSM \*me);
- QState GPS\_config\_cgdcont(GPSHSM \*me);
- QState GPS\_config\_scfg(GPSHSM \*me);
- QState GPS\_config\_cgqmin(GPSHSM \*me);
- QState GPS\_config\_sgact(GPSHSM \*me);
- QState GPS\_config\_sgdeact(GPSHSM \*me);
- QState GPS\_gps\_acquire(GPSHSM \*me);
- QState GPS\_http\_connect(GPSHSM \*me);
- QState GPS\_http\_send\_request(GPSHSM \*me);
- QState GPS\_http\_suspend(GPSHSM \*me);
- QState GPS\_http\_disconnect(GPSHSM \*me);

```
Terminal — vim — 80x35

QState GPS_powerup(GPSHSM *me) {
    switch (Q_SIG(me)) {
        case Q_ENTRY_SIG : {
            QActive_arm((QActive *)me, 2*BSP_TICKS_PER_SEC);
            return Q_HANDLED();
        }
        case Q_EXIT_SIG : {
            QActive_disarm((QActive *)me);
            return Q_HANDLED();
        }
        case Q_TIMEOUT_SIG : {
            QActive_arm((QActive *)me, 2*BSP_TICKS_PER_SEC);
            me->parse_idx = 0;
            serialStr3(me, CMD_ATZ);
            return Q_HANDLED();
        }
        case SERIAL_RX_DATA3_SIG : {
            SerialParam pa;
            pa.param = Q_PAR(me);
            switch (GPSParse(me, CMD_ATZ RESP_OK)) {
                case -1:
                    return Q_HANDLED(); /* Drain until we timeout again. */
                case 0:
                    return Q_HANDLED();
                case 1:
                    return Q_TRAN(&GPS_powerup_echooff);
            }
        }
    }
    return Q_SUPER(&GPS_operational);
}
```

```
Terminal — vim — 80x35
/*.....*/
QState GPS_operational(GPSHSM *me) {
    switch (Q_SIG(me)) {
        case Q_ENTRY_SIG : {
            QActive_arm((QActive *)me, 1*BSP_TICKS_PER_SEC);
            me->tx0_head = me->tx0_tail = 0;
            me->tx3_head = me->tx3_tail = 0;
            return Q_HANDLED();
        }
        case Q_TIMEOUT_SIG : {
            serialStr0(me, "\r\nLoading...\r\n");
            return Q_TRAN(&GPS_powerup);
        }
        /* transmitter */
        case SERIAL_TX_EMPTY0_SIG : {
            /* no characters left in buffer to transmit */
            if (me->tx0_head != me->tx0_tail) {
                /* if SERIAL_BUSY returned, signal was stale, wait for next */
                if (serialTransmit(USART0, me->tx0_buffer[me->tx0_tail])) {
                    return Q_HANDLED();
                }
                /* else character is transmitting, update tail index */
                me->tx0_tail = (me->tx0_tail + 1) % TX_BUFFER_SIZE;
            }
            return Q_HANDLED();
        }
        case SERIAL_TX_EMPTY3_SIG : {
            /* no characters left in buffer to transmit */
            if (me->tx3_head != me->tx3_tail) {
                /* if SERIAL_BUSY returned, signal was stale, wait for next */
                if (serialTransmit(USART3, me->tx3_buffer[me->tx3_tail])) {
                    return Q_HANDLED();
                }
                /* else character is transmitting, update tail index */
            }
        }
    }
}
```

```
Terminal — screen — 80×35

Loading...
ATZ
ATZ

OK
ATE0
ATE0

OK
AT+CGDCONT=1,"IP","yesinternet","0.0.0.0",0,0

OK
AT#SCFG=1,1,512,30,300,100

OK
AT+CGQMIN=1,0,0,3,0,0

OK
AT#SGACT=1,0

OK
AT#SGACT=1,1

#SGACT: 114.74.8.49

OK
Success: |114.74.8.49|
AT$GPSACP

$GPSACP: 164221.876,,,,,0,,,,031106,00

OK
Success: |164221.876,,,,,0,,,,031106,00|
```

```
Terminal — screen — 80x35
OK
AT#SGACT=1,1

#SGACT: 114.74.8.49

OK
Success: |114.74.8.49|
AT$GPSACP

$GPSACP: 164221.876,,,,,0,,,,031106,00

OK
Success: |164221.876,,,,,0,,,,031106,00|
AT#SD=1,0,80,"www.lathiat.net"

CONNECT
GET /gps.php?pos=164221.876,,,,,0,,,,031106,00 HTTP/1.1
Host: www.lathiat.net

HTTP/1.1 200 OK
Date: Fri, 09 Apr 2010 16:42:33 GMT
Server: Apache/2.2.12 (Ubuntu)
X-Powered-By: PHP/5.2.10-2ubuntu6.4
Vary: Accept-Encoding
Content-Type: text/html
Content-Length: 12

XXX SUCCESS
        finish+++

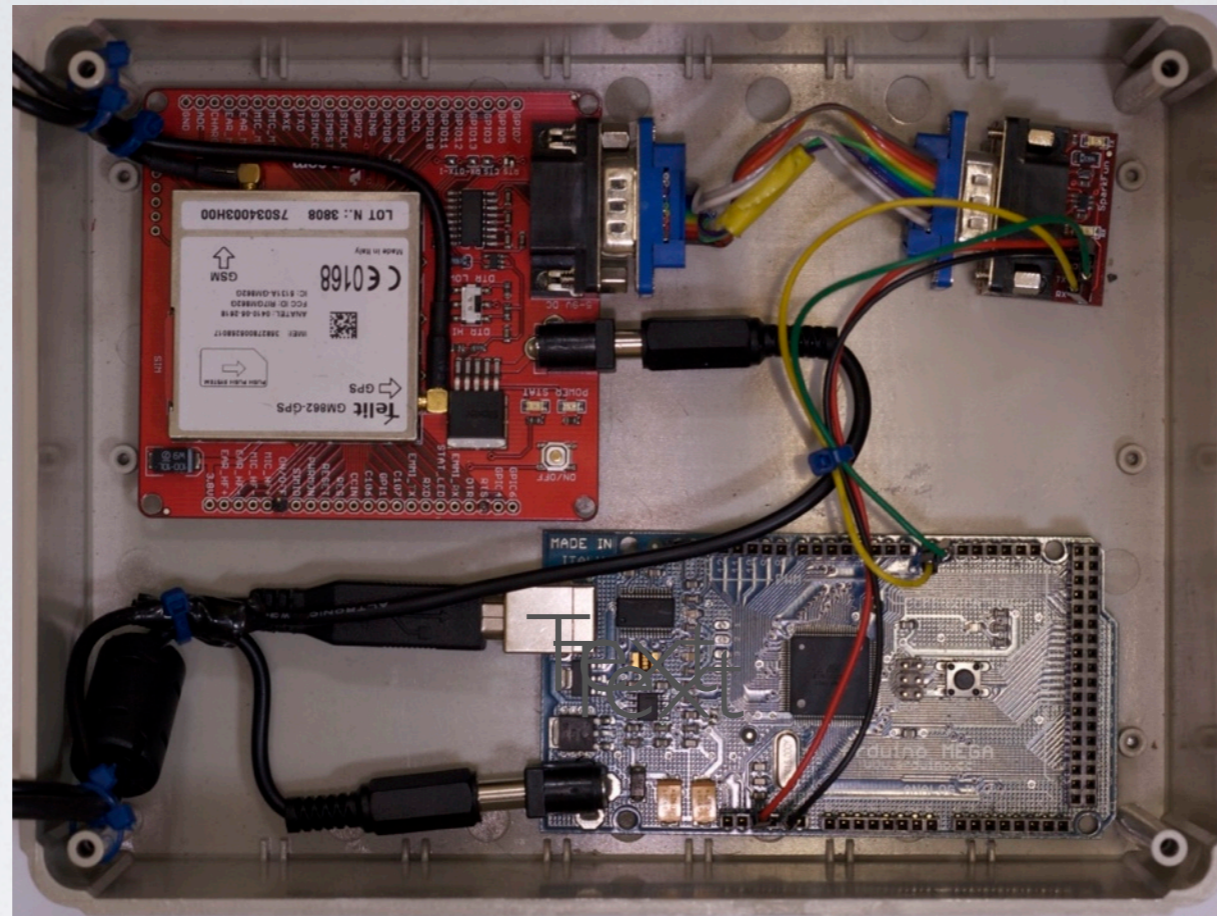
OK
AT#SH=1

OK
AT$GPSACP
```

# RESOURCES

- “Practical Arduino” by Jonathon Oxer, Hugh Blemmings
- <http://www.toysdownunder.com/>
- <http://www.littlebirdelectronics.com/>
- <http://www.sparkfun.com/>
- <http://www.nkcelectronics.com>
- <http://www.artifactory.org.au/>

# QUESTIONS?



<http://lathiat.net/>  
[lathiat@burst](mailto:lathiat@burst)

The Artifactory!

What is it?  
find out!

Thank-you to Harry McNally for  
lots of help with the software/statecharts.